



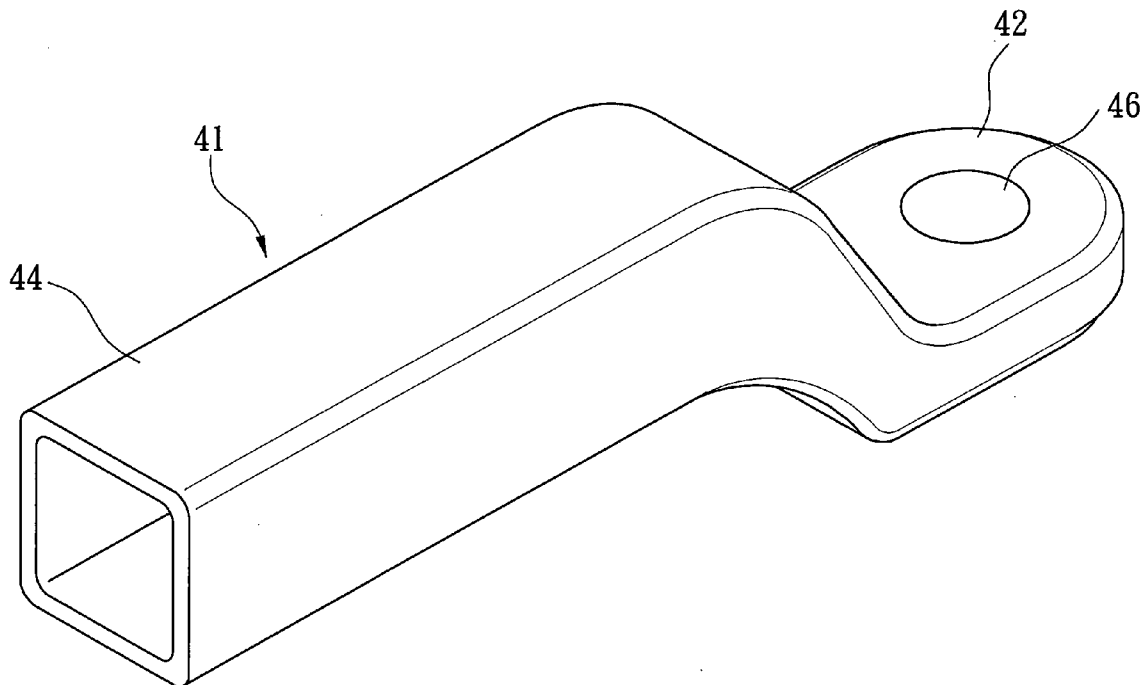
US 20090126445A1

(19) **United States**(12) **Patent Application Publication**
Liu(10) **Pub. No.: US 2009/0126445 A1**(43) **Pub. Date: May 21, 2009**(54) **FORGING MOLD MANUFACTURING
PROCESS OF TOWING BAR**(52) **U.S. Cl. 72/267; 164/80**(76) **Inventor: Chang Fa Liu, Beidou Township
(TW)**(57) **ABSTRACT**

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FALLS CHURCH, VA 22041 (US)**(21) **Appl. No.: 11/984,579**(22) **Filed: Nov. 20, 2007****Publication Classification**(51) **Int. Cl.**
B22D 23/06 (2006.01)
B21C 23/18 (2006.01)

A process operating a forging mold for manufacturing a towing bar involves having a softened aluminum material after preheating in a mold; the mold contains a molding cavity; one end of the cavity is provided with a contour of a gooseneck of the towing bar and another end is provided with a contour of a middle section of a shank of the towing bar; the mode is then incorporated with an extension mold containing an extension hole for molding an extended section of the shank of the towing bar; a punch performs forging process on the aluminum material in the cavity externally from the extension hole; and the aluminum material is extruded by the punch to extend for a preset length in the direction towards the extension mold to complete the molding of the towing bar.



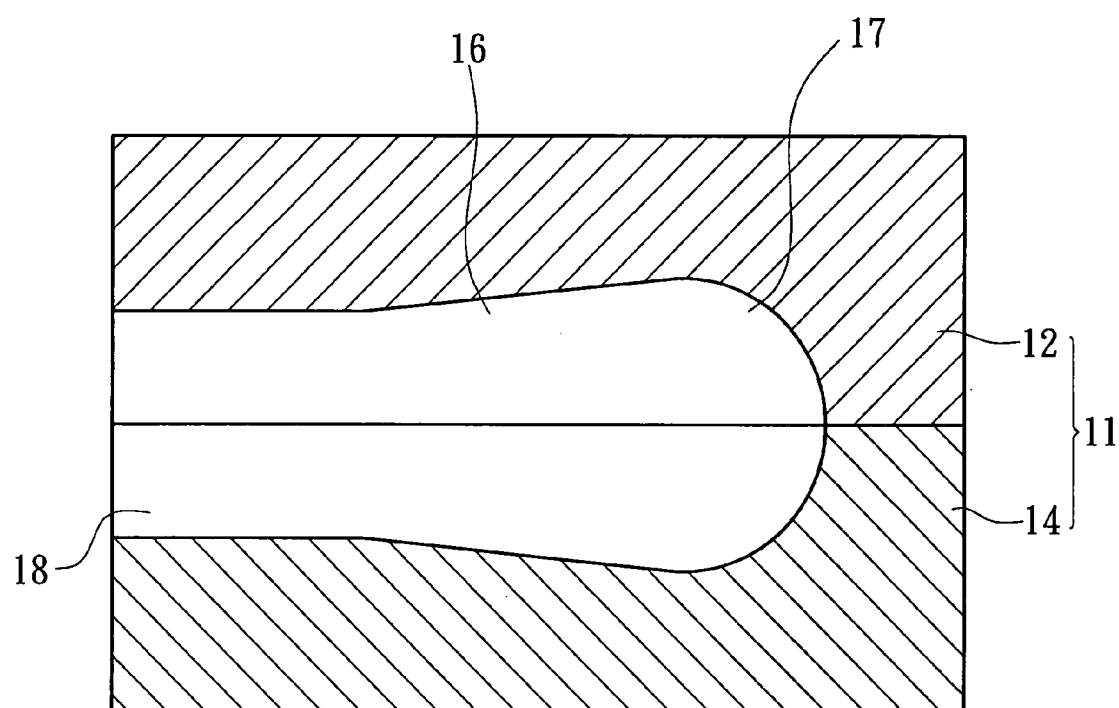


FIG. 1

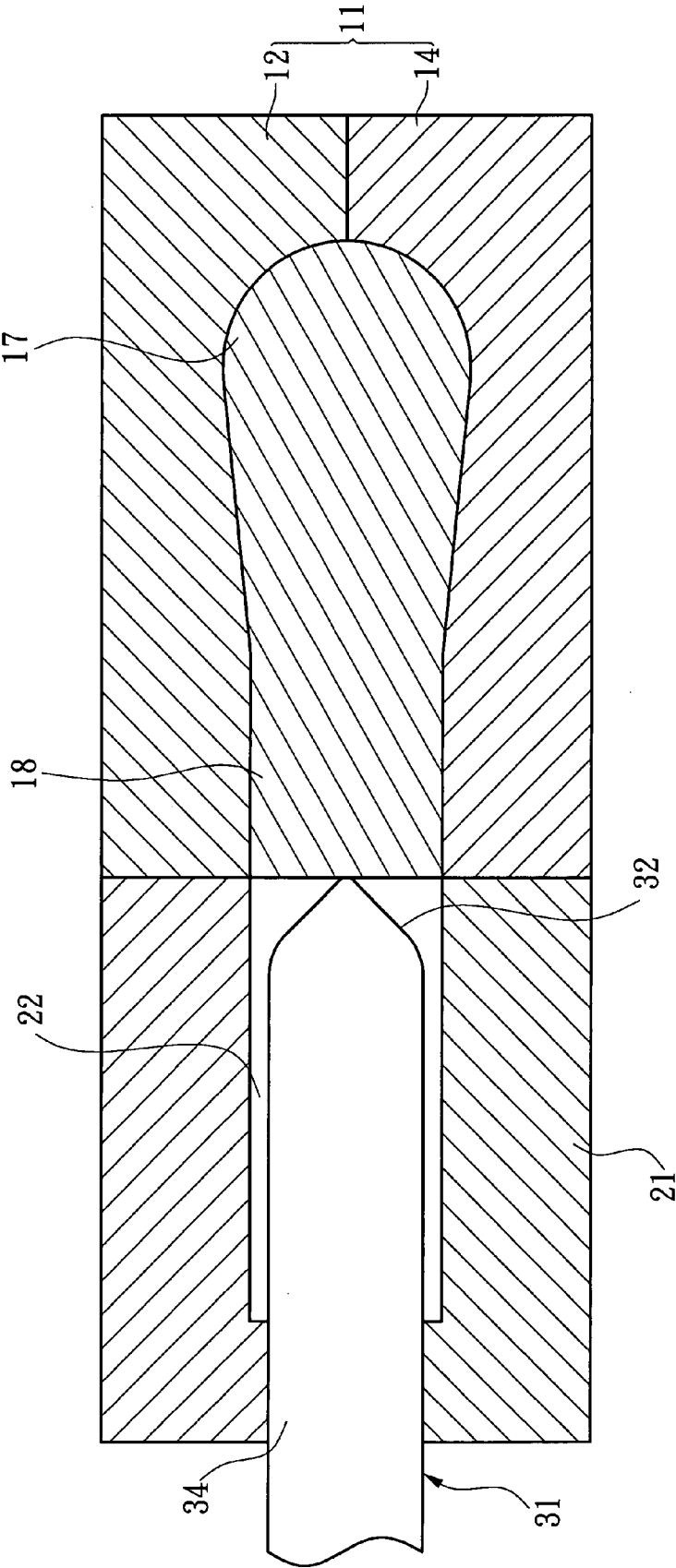


FIG. 2

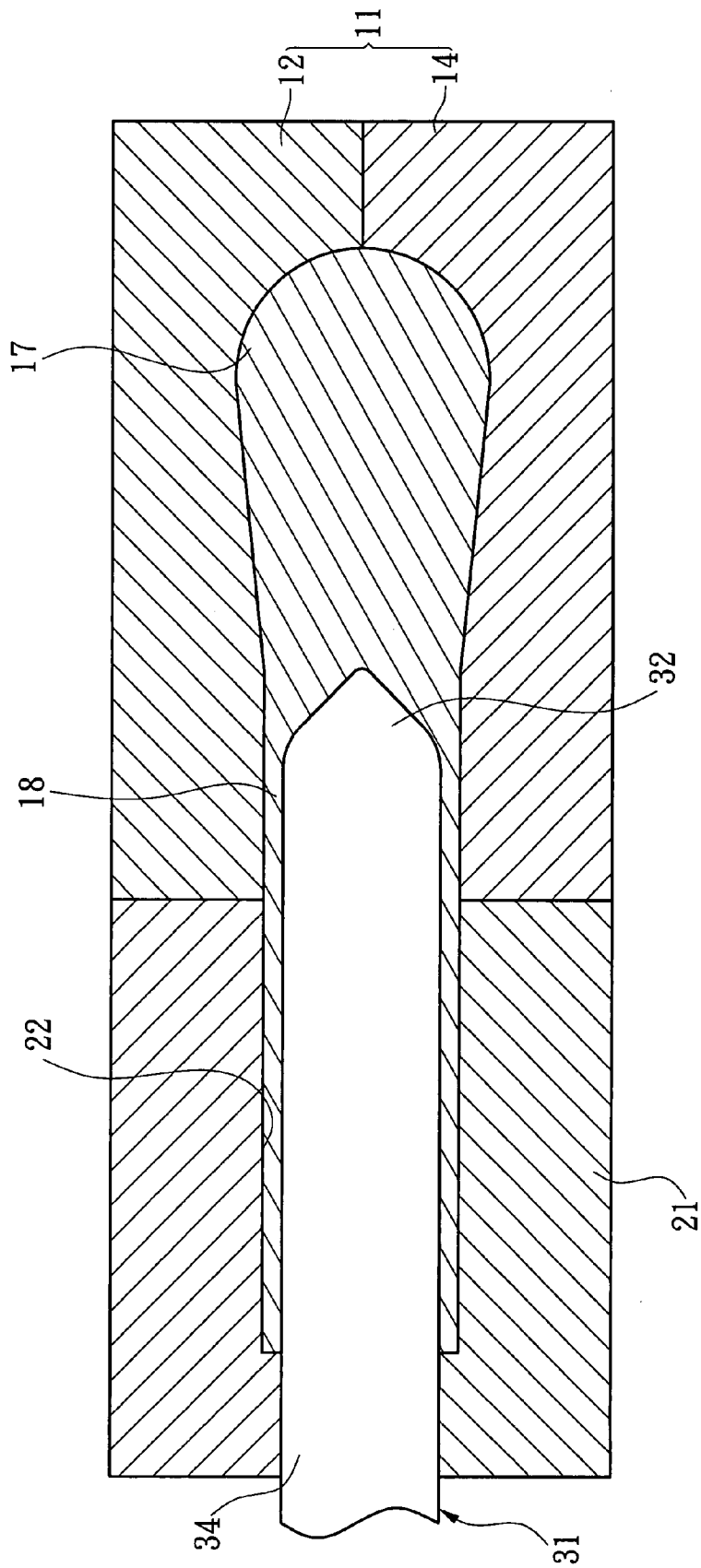


FIG. 3

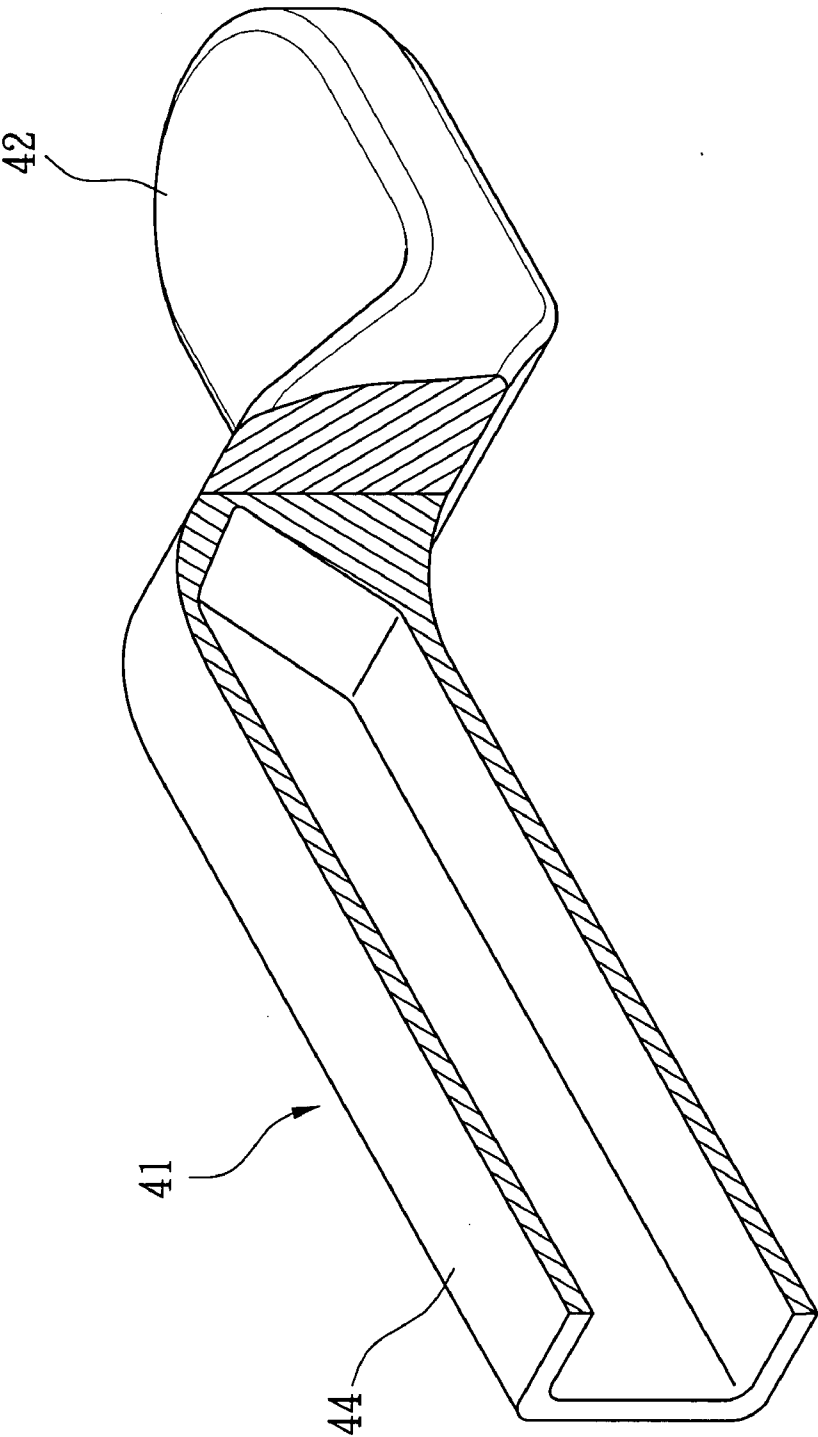


FIG. 4

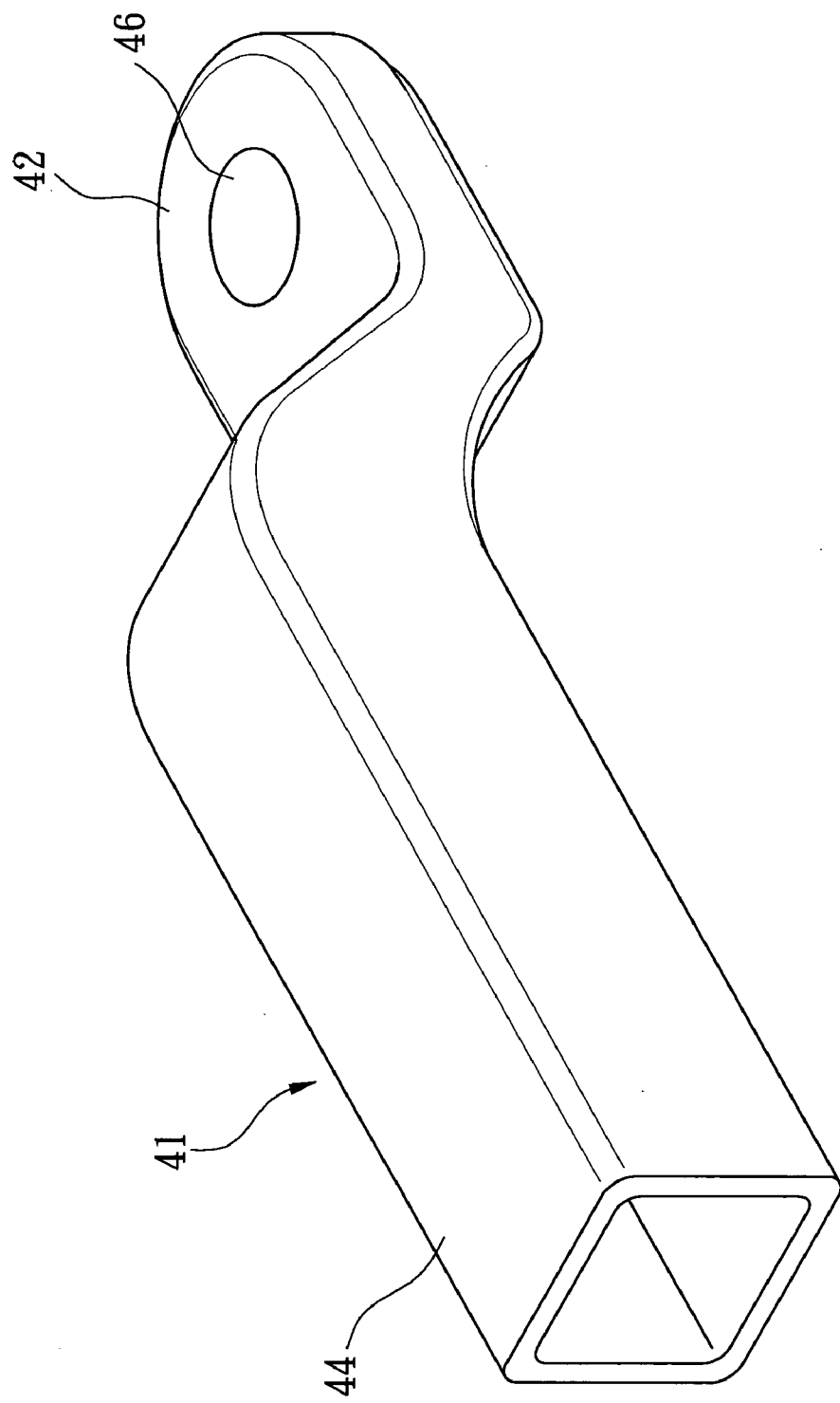
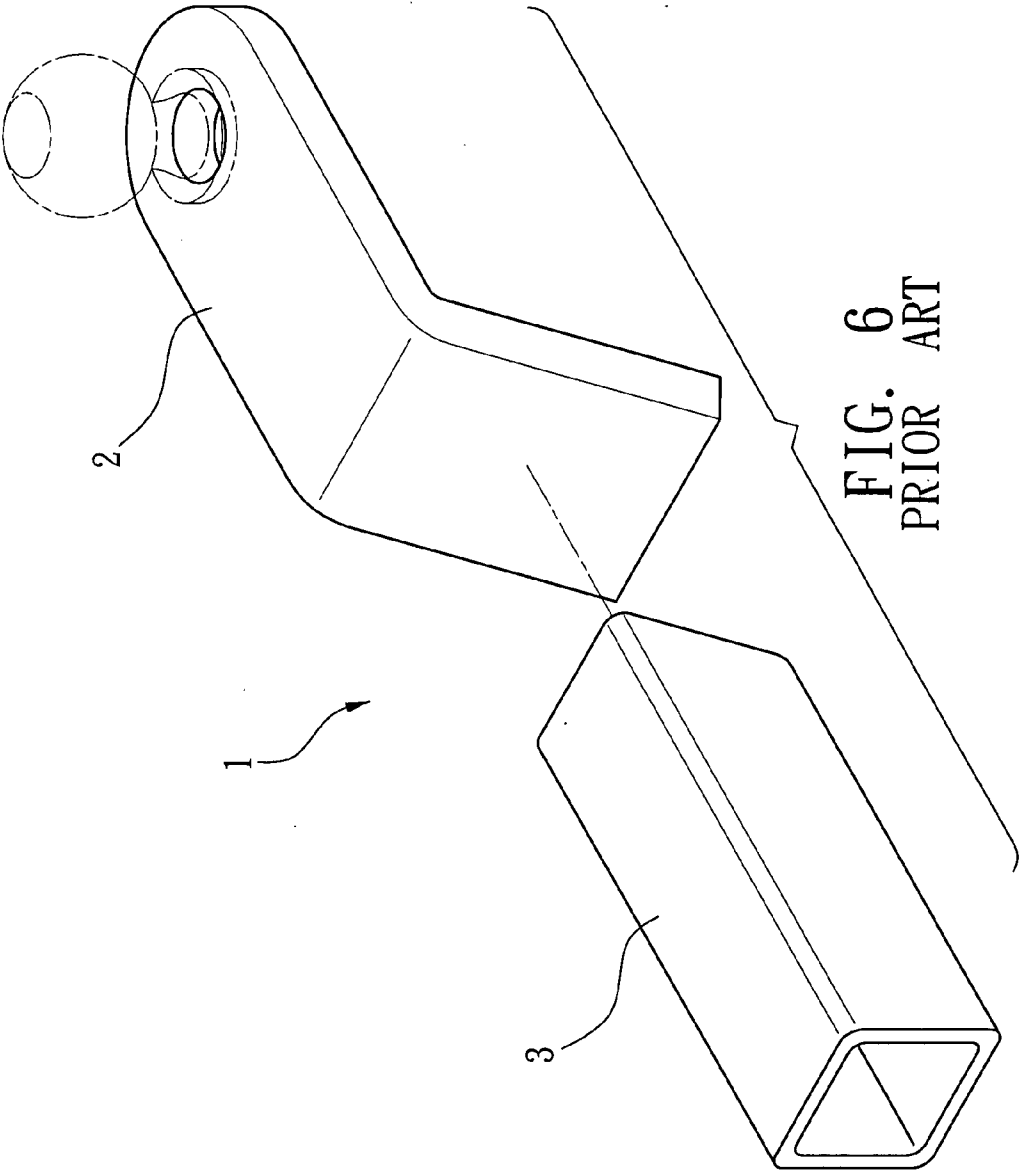


FIG. 5



FORGING MOLD MANUFACTURING PROCESS OF TOWING BAR

BACKGROUND OF THE INVENTION

[0001] (a) Field of the Invention

[0002] The present invention is related to a manufacturing process of a trailer towing bar, and more particularly, to one that operates a forging mold to manufacture the towing bar.

[0003] (b) Description of the Prior Art

[0004] As illustrated in FIG. 6 of the accompanying drawings of the present invention, a towing bar 1 of the prior art is comprised of a gooseneck 2 and bar 3. Whereas the rod 3 is related to a hollow piece, the gooseneck 2 and a shank 3 are separately manufactured before welding both into one piece. However, the manufacturing process of the towing bar 1 consumes lengthy time and the towing bar 1 is vulnerable to break up at where the welding takes place in the event of poor welding quality or an object of excessively heavy weight is towed. The strength of the towing bar 1 is highly demanded since it has to tow a heavy object. Therefore the towing bar 1 is usually made of high strength steel; however, the inherited weight of the towing bar 1 makes its use and installation comparatively inconvenient.

[0005] To reduce the weight of the towing bar, aluminum material is used instead. To prevent insufficient strength of the aluminum material when made into a towing bar, the aluminum material is first forged into an integrated part of a blank and then drilled to become a hollow towing bar. However, this process causes massive waste of aluminum material to fail economic benefits and the drilling operation also requires additional process and increase production cost.

SUMMARY OF THE INVENTION

[0006] The primary purpose of the present invention is to provide a process operating a forging mold for manufacturing a towing bar to effectively upgrade manufacturing process efficiency of the towing bar while meeting the requirements of a hollow shaft of the towing bar and effectively saving material and time required for post-process.

[0007] To achieve the purpose, the present invention is comprised of the following steps:

[0008] a. Have a preheated and softened aluminum material in a mold containing a molding cavity, one end of the cavity is made in a contour of a gooseneck of the towing bar; and another end, a middle section of a shank of the towing bar;

[0009] b. An extension mold is connected to the mold and provided with an extension hole for molding an extended section of the middle section of the shank of the towing bar;

[0010] c. A punch performs forging on the aluminum material in the cavity externally from the extension hole; and

[0011] d. As extruded by the punch, the aluminum material extends in the direction of the extension mold for a preset length to complete molding of the towing bar.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a plane sectional view showing a mold of the present invention.

[0013] FIG. 2 is a schematic view showing a layout of the present invention before forging an aluminum material.

[0014] FIG. 3 is a schematic view showing the aluminum material is forged in the present invention.

[0015] FIG. 4 is a sectional view showing a local part of a towing bar manufactured using the present invention.

[0016] FIG. 5 is a perspective view showing the towing bar manufactured using the present invention.

[0017] FIG. 6 is an exploded view showing the towing bar manufactured using the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] Referring to FIGS. 1, 2, and 3, a process of the present invention for manufacturing a towing bar is related to a continuous forging mold set essentially comprised of a mold 11, an extension mold 21, and a punch 31.

[0019] The mold 11 is comprised of an upper mold 12 and a lower mold 14; two halves of cavities in symmetry respectively formed from the upper mold 12 and the lower mold 14 constitute a molding cavity 16 at where both of the upper and the lower molds 12 and 14 are clamped to each other; one end of the cavity 16 is made in a contour of a gooseneck of the towing bar to form a gooseneck molding portion 17; and the other end of the cavity 16 is made in a contour of a middle section of a shank of the towing bar to form a shank molding portion 18.

[0020] The extension mold 21 contains an extension hole 22 to form an extended section for the shank molding portion 18 in the cavity 16.

[0021] The punch 31 has a tapered head 32 and a square shank 34.

[0022] With the continuous mold set as described above, a process operating a forging mold for manufacturing the towing bar of the present invention is comprised of the following steps:

[0023] a. Preheat an aluminum material preheated for the aluminum material to indicate a softened status and place the aluminum material into the cavity 16 of the mold 11;

[0024] b. The extension mold 21 is connected to the mold 11 and the extension hole 22 in the extension mold 21 is connected to the shank molding portion 18 in the cavity 16 of the mold 11;

[0025] c. The punch 31 performs forging on the aluminum material in the cavity 16 externally from the extension hole 22 as illustrated in FIG. 2; and

[0026] d. The tapered head 32 of the punch 31 penetrates into the cavity 16 to where the gooseneck molding portion 17 and the shank molding portion 18 are connected to each other thus to extrude the aluminum material, which in turn extends in the direction of the extension hole 22 of the extension mold 21 for a preset length as illustrated in FIG. 3 to complete molding of the towing bar.

[0027] As illustrated in FIG. 4, a finished product of a towing bar 41 manufactured using the process described above is made in an integrated part in a same forging equipment thus to effectively upgrade efficiency of the manufacturing process while meeting the requirements of having a solid gooseneck 42 and a hollow shank 44 and reducing waste of aluminum material. A through hole 46 is drilled on the gooseneck 42 of the towing bar to complete a post process for the towing bar as illustrated in FIG. 5.

[0028] Accordingly, the process operating a forging mold for manufacturing a towing bar of the present invention provides the following advantages:

[0029] 1. The towing bar is made in an integrated part to effectively summarize the process and save process time thus to effectively upgrade the efficiency of the manufacturing process.

[0030] 2. Forging with the punch allows smooth molding of the shank of the towing bar to effectively reduce waste of aluminum material for achieving purposes of reduced production cost and making the product even more competitive.

[0031] 3. The towing bar is made of aluminum material to provide a light structure for easy use and installation of the towing bar.

I claim:

1. A process operating a forging mold for manufacturing a towing bar comprising the following steps:

- a. Have a preheated and softened aluminum material in a mold containing a molding cavity, one end of the cavity is made in a contour of a gooseneck of the towing bar; and another end, a middle section of a shank of the towing bar;
- b. An extension mold is connected to the mold and provided with an extension hole for molding an extended section of the middle section of the shank of the towing bar;

c. A punch performs forging on the aluminum material in the cavity externally from the extension hole; and

d. As extruded by the punch, the aluminum material extends in the direction of the extension mold for a preset length to complete molding of the towing bar.

2. The process operating a forging mold for manufacturing a towing bar as claimed in claim 1, wherein one end of the punch penetrates into the molding cavity at where the gooseneck of the towing bar and the shank of the towing bar are connected to each other.

3. The process operating a forging mold for manufacturing a towing bar as claimed in claim 1, wherein the punch is provided with a square shank in the shape of a bar.

4. The process operating a forging mold for manufacturing a towing bar as claimed in claim 1, wherein the end of the punch is tapered.

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